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KINAESTHESIA, A NEW AID TO THE TEACHING OF SPEECH[1]

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That American speech is ineffective is generally admitted. Many reasons have been offered for this. During its first years of life a child is very susceptible to all manner of influences. If the speech of the parents is clear and distinct, the speech of the children is generally of the same quality. If the speech of the parents is incorrect or negligent, the same fault will probably appear in the children.

Teachers of English in our schools and colleges are deploring the fact that their pupils do not speak distinctly. It is therefore evident that the teaching of speech to children is unsatisfactory; for few children learn to make accurately the fundamental sounds of our language, and under existing conditions of life it is almost impossible for them to acquire correct utterance in later years.

When a child enters our schools, its primary knowledge of the sounds of our language is acquired mainly through the sense of hearing aided by the sense of vision. If this training were sufficient, children would have no difficulties; but modern education has proved concretely that contemporaneous sense training in the early education of a child is of vast importance. Physiologists, psychologists, and neurologists agree in this opinion. Auditory and visual sense training is only a partial appeal, and in a vast number of cases a faulty appeal. Through hearing we obtain the result of the primary revival of words which took place through a subconscious process in the auditory center. This is followed immediately by a correlated revival of sensory motor images. This is psychologically and neurologically correct, but the fact must be taken into consideration that *all* people do not hear alike, that there is a great range of differences in people's hearing, whether they are young or old.

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I have personally examined a great number of school children for their hearing and have found varied differences above and below normal, i.e., the hearing power was not uniformly acute throughout its entire pitch range. Technically such a child has *islands* of defective hearing in its organ of Corti; therefore, while the child's hearing is fairly satisfactory for ordinary purposes, it does not hear parts of word sounds which are essential to the understanding of speech and the registration of correct word images in the cortex of the brain.

The teacher's efforts, when repeating to a child a sound over and over again, as a model for imitation, irrespective of whether she herself is making the sound correctly, are a loss of time and energy, because a child who has defective islands of hearing never gets the sounds clearly, though we labor under the delusion that the child heard what it was told. This fact definitely indicates one of the principal sources of careless and defective speech.

In recent years, when desiring complete sense appeal, psychologists have realized the importance of the tactile-motor (kinaesthetic) sense, which occupies the whole of the post-central convolution of the brain. A great English physicist, indeed, holds that all our special senses are but modifications of the sense of touch. If conclusive, this explains the stress placed on muscular-tactile development which has been emphasized by Montessori in her system of special education. If a given letter is shown and sounded and a child is asked to trace it, four sensations develop contemporaneously, viz., the auditory, the visual, the tactile, and the muscular (kinaesthesia) sensations.

In the study and care of a large number of defective-speech cases both here and abroad I have come to place a great deal of reliance on kinaesthesia or kinaesthetic imagery; and by that I mean the sense of muscular movement of the parts which are active in producing speech, as the tongue, lips, jaw, etc. The idea presented itself rather forcibly to me: If kinaesthesia is so important, why not utilize it in the teaching of speech to normal children, especially since mental images in most of us are kinaesthetic as well as auditory?

The kinaesthetic sense is very often confused with the tactile sense, the sense of touch; but of course you realize that they are separate and distinct from each other. The tactile sense expresses contact between the fingers and an object, while the kinaesthetic sense expresses muscular movement.

In our work with defective-speech cases we always try to find out to what extent each patient uses his different senses in the process of changing his speech thought into spoken words, and results have proved that kinaesthetic imagery, or the feeling of muscular movements, plays a very important rôle in the ultimate cure of cases. Kinaesthetic sensations of muscle action are acquired readily and permit of development to a high degree. One can easily learn to feel the sensations of muscular actions and be able to call them into consciousness. I find that dependence upon the hearing sense solely, or even hearing aided by the visual sense, is not sufficient to obtain necessary results.

A person may be able to hear, yet possess no memory for what he has heard, though he is able to think words and speak fluently. In such cases a child or an adult, when learning to speak, does so through the muscular sense of feeling, and uses his hearing simply to guide him. I refer here to cases where experiments have been made showing lack of memory and not lack of attention.

The same holds true in children who are born deaf; if their internal language depended solely on their hearing or auditory memory how would they ever learn to speak? Yet you all have visited the schools for the deaf and have observed children who are totally deaf speaking fluently and using their sight and feeling as guideposts. The words are definitely remembered through the sense of feeling because, while there may be visual images of the movements of the lips and tongue, the *action* of the larynx, pharynx, soft palate, etc., in memory must be *felt*. The case of Helen Keller, who is both blind and deaf, demonstrates this power. She depends for guidance in her vocalization and articulation on the kinaesthetic areas of her brain; for she cannot see her muscular action, she cannot hear the results of their action, she only *feels* the action for each syllable and word which she utters.

In her case the knowledge of the muscular movements of the vocal organs was the fundamental basis on which speech depended. You may ask, "Should every child be trained as Helen Keller was?" No, I do not wish to be misunderstood; but I wish to emphasize the fact that if teachers who have charge of our young had a broader and more definite knowledge of the muscular movements of the vocal organs, the basis on which speech depends, they would be better able to cope with the deficiencies of pupils, whether due to the auditory or to the visual imperfection.

I propose to try to show the great necessity for a wider knowledge of the sense of muscular movements of our speech organs. This can be best attained through a demonstration of radiographic plates that show the different positions assumed by the vocal organs in uttering the fundamental sounds of our language. These plates give an accurate representation of the true relative position of structures which lie at different levels from the surface, and the structures are as large as they appear in nature. The plates provide a correct record of the positions assumed by the vocal organs. The positions are based upon recognized phonetic standards, advanced by such phoneticians as Bell, Sweet, Rippman, Gutzmann, and others.

These plates, numbering about thirty-two, show the different positions assumed by the vocal organs in making the vowels and consonants. In utilizing them to teach a child a certain position, as, for instance, when a child says *tandy* for *candy*, substituting a *t* for a *k* sound, and cannot be made to hear and imitate the correct sound, the teacher, seeing the correct position on the plate, can very readily make the child place his vocal organs in the proper position and say *candy* instead of *tandy*.

Another feature which I wish to point out about these plates is their power of promoting attention and concentration. Attention is the basis of concentration, and concentration is an indispensable aid to a child's acquisition of speech. You all know and have experienced how futile one's efforts to instruct a child are if the child cannot be made to pay attention. When first teaching the sounds of speech to a child a great deal depends on the power of directing and sustaining the child's attention. This new aid to the teaching of speech (kinaesthesia), introduced in the classroom and taught through a series of charts and stereoscopic pictures, will prove of great value in attracting and concentrating children's attention. What child does not delight to see and imitate that which it sees in pictures?

In conclusion, speech is a matter of association and the different senses must be appealed to. The more clues there are for memory the better are the chances for recall. The mechanism of articulate language is perfected in children between the ages of two and seven, for at that period perception and motility are marked, memory is tenacious, and muscular mechanisms become fixed. Connections between the auditory and the motor channels of spoken language influence the complicated movements of our vocal organs which produce articulate speech, and perfection of these movements depends upon hearing and association.

Poor hearing results in wrong auditory perception, wrong motor action, and consequently imperfect speech. To counteract wrong auditory perception we must strive to educate to a degree of perfection the so-called sixth sense, the muscle sense, technically known as the *kinaesthetic* sense, which is paramount in every effort we make at speech, especially during the period of easy motor adaptation.

Every muscular movement that we make carries with it a tendency to repetition; with each successive repetition this tendency becomes stronger, until after a sufficient number of performances the movement takes on the character of automatic or reflex action. Every movement tends by repeated performances to grow easier, involving less close attention and conscious effort. Although it is generally maintained that attention to muscular sensations is a disturbing influence in the performance of motor acts, such as the playing of musical instruments, any form of manual training, or the most popular form of physical education of today, driving an automobile, the undeniable fact still remains that at first in order to grasp the idea there is some attention paid to muscular sensations. Are we not all familiar with the classical phrase of the automobile instructor, "Forget you have feet, and remember the road"? This is evidence that at first we are conscious of the act our feet are performing and that only through repetition does the act become automatic or reflex. The same holds true with good articulation or good speech; it is largely, if not entirely, a matter of subconscious action. The more closely it approaches the automatic stage the more perfect it becomes, other things being equal. After the fundamental movements of the vocal organs are firmly established for speech, the mind will gradually free itself from the consideration of mechanical details and the speech will be distinct, clear, and correct.

The only way for the child to attain this subconscious, automatic speech stage is through the primary possession of correct movements of the parts concerned in speech, and for this he naturally looks to his teacher. A thorough knowledge of the plates on the part of the teacher will readily adjust any irregularities of sound formation in the pupil. With one clean sweep we eliminate the old refrain often exchanged by teachers, "Little Mary says *toap* for *soap*, and I don't know what to do for her."